

**Federal Communications Commission:**  
*Rural Health Care Pilot Program Order*

**WC Docket No. 02-60**

**Request for Funding**

***Applicant***

Valley View Hospital is a 501(c)(3) non-profit rural community hospital, and is classified as a charitable, tax-exempt corporation. The hospital is a general acute-care facility and is licensed to operate 80 acute-care beds. In 1998, Valley View was designated a Level III Trauma Center, able to provide initial evaluation and stabilization (surgically if appropriate) to those trauma patients who may require transfer to a Level I or II trauma center, and to those who can be maintained in a stable or improving condition with specialized care. The Hospital's comprehensive services include: medical/surgical; obstetrics; intensive care unit/critical care unit; alcohol/substance abuse; rehabilitation; hospice; nursery (level II); and, trauma (level III) as mentioned. Over 120 physicians are affiliated with the hospital and provide services to area residents.

As applicant to the Federal Communication Commission's *WC Docket No. 02-60*, Valley View Hospital will be legally and financially responsible for the conduct of activities outlined in this application if awarded funds by the FCC.

***Clientele***

Our service area covers roughly a 50-mile radius, including the three counties of Eagle, Pitkin and Garfield in western Colorado. We also serve a large tourist population. Currently 117,323 residents live in Eagle, Pitkin and Garfield Counties; we expect the local population to increase to 134,280 residents by 2010. In 2006, Valley View had 10,064 patient visits to the emergency room. Additionally, 5,137 surgical procedures were performed and 778 babies were born at the hospital.

***Successes and Accomplishments***

As an accredited facility, Valley View successfully completed the Joint Commission for the Accreditation of Hospital Organizations and College of American Pathologists surveys and inspections. These ensure implementation and successful use of quality standards and procedures – all of which are designed to keep patients, as well as business operations, healthy.

Financial success is another key measure for the hospital. Valley View maintains sound financial practices that have enabled us to reinvest profits in facilities, equipment, staff and services. Recent accomplishments include:

- Completion of Phase 1 of a three-phase, \$50 million expansion. The first phase provided modernization and expansion of the Emergency Department, expansion of Radiology, Respiratory Therapy and Pharmacy departments, and the addition of the Family Birthplace.
- Phase 2 of the expansion was recently completed. This phase involved expansion of the Surgery Department, a new Heart and Vascular Institute, and improved Critical Care Unit.
- Phase 3 of the expansion includes a second cardiac catheterization lab, and other critical care and acute care beds as needed.

In 2006, Valley View Hospital provided \$ 3.5 million in charity care and absorbed \$ 26 million not covered by Medicare and Medicaid.

Valley View Hospital has five main quality management systems that support the development of quality and means for measuring improvement and success.

1. Core measures from the Joint Commission for the Accreditation of Hospital Organizations are mandatory for accreditation.
2. The Centers for Medicare and Medicaid Services (CMS) clinical quality measures; Valley View Hospital voluntarily incorporates these into its quality management system.
3. The Leapfrog Group is another national quality management system provided for hospitals. It utilizes 30 different indicators, some of which overlap with JCAHO and CMS. The hospital has used Leapfrog measures for 3 years.
4. The Institute for Health Care Improvement is a voluntary program, focusing on a "Let's Save 100,000 Lives" Campaign. This includes six clinical initiatives. According to the institute, if all hospitals in the nation were to participate, 100,000 lives would be saved over an 18-month period. Valley View Hospital is contributing to an actual count of lives saved through these specific initiatives.
5. Within two days of release, every patient gets a satisfaction questionnaire, which is recorded and analyzed by Press Ganey, a national patient satisfaction database clearinghouse. This enables Valley View Hospital to compare its statistical measures with hundreds of hospitals across the nation. The analysis correlates results with patient level of importance, so that performance improvement goals and objectives may be prioritized.

### ***Awards***

Valley View Hospital was honored in 2004 to be included on Solucient's "Top 100 Hospitals in the Country" list. This award was based on seven criteria including clinical, marketing, and financial elements. This award speaks to the overall management of the hospital and its quality.

Additionally, Valley View has been recognized for service excellence under the *J.D. Power and Associates Distinguished Hospital Program*. The recognition is based on five key drivers of patient satisfaction with their overall hospital experience. These drivers include: dignity and respect, speed and efficiency, comfort, information and communication, and emotional support. Valley View was one of only 36 hospitals in the nation and the only Colorado hospital to receive this honor.

### ***Telemedicine and Information Technology Leadership***

At Valley View Hospital, we pride ourselves on being a progressive, technology-focused organization. We strive to keep current with technological advances that enable our healthcare providers to deliver personalized, high-quality care as timely and efficiently as possible. As part of this effort, we have implemented four successful telemedicine programs.

1. **PACS - “Picture Archiving and Communication System”:** Implemented in 2004, this system digitally stores pictures taken by a CT scanner, MRI, X-ray and/or Mammography machine. Valley View Hospital’s PACS system is interconnected with various Western Colorado hospitals (St. Mary’s in Grand Junction, CO, Pioneer’s Medical Center, Meeker, CO, Aspen Valley Hospital, Aspen CO and Craig Memorial Hospital in Craig, CO). This interconnection allows physicians at one of these rural hospitals to share these diagnostics radiology studies via the Internet with a radiologist at Valley View Hospital for diagnostic and treatment consultations. With the introduction of the new Heart and Vascular Center at Valley View Hospital in 2007, PACS has been expanded to include cardiology services.
2. **Atlas Reference Labs interface:** Starting in November 2004, Valley View’s interface with the Mayo Medical Laboratories allowed for a direct transmission of data to Valley View’s Meditech system. This service offering which includes Chemistry, Microbiology, Pathology, Cytology, Blood Bank, Genetic and other testing services allows easier and more rapid access to laboratory services with the ability to place orders and return accurate and timely laboratory results via a bi-directional link. Test results are received electronically from the laboratory and stored in the patient’s electronic records for viewing. Valley View expanded this program in 2006 to allow other facilities (physician offices, other rural western Colorado hospitals) to utilize Valley View Hospital as their reference laboratory (test ordering and result transmission) with Valley View interfacing with Mayo Medical Laboratories where necessary.
3. **VPN – “Virtual Private Networks”:** With implementation starting in 2004, this VPN technology continues to date and allows physicians to connect remotely via the Internet through a secure connection directly to systems within Valley View Hospital. This allows physicians located in remote clinics, other rural Western Colorado hospitals and other remote locations to interface with Valley View

Hospital systems for patient records, lab test results, pharmaceutical records, radiology studies, etc. on a 24/7, 365 day basis. VPN services has also been expanded to allow vendors and employees to have secure remote access to the hospital's network resources in order to provide vendor application and system support and remote transcription activities. In 2006, VPN services were expanded for telemedicine at Pioneer's Medical Center, in Meeker, CO.

4. **Bandwidth Expansion:** In 2005, Valley View Hospital's Internet connectivity was successfully migrated from a T-1 line to the City of Glenwood Springs Fiber network thus enhancing the Internet bandwidth to T-3 capabilities. Valley View Hospital's six outlying rural clinics' connectivity was upgraded to broadband capabilities. Beginning in August, 2006, wireless capabilities (secure and unsecured) used by hospital personnel was expanded and the new Internet café was implemented providing wireless access to the patient families and public.

### ***Request***

Under the Federal Communication Commission's *WC Docket No. 02-60*, Valley View Hospital proposes to build on its' successful telemedicine programs by expanding into a real-time telehealth program. We seek funding from the Federal Communications Commission to purchase an RP-7 robotic system, which is a tele-operated, mobile robotic system that enables remote presence. We request that the FCC waive the requirement for competitive bidding, as our research indicates that the RP-7, manufactured by InTouch Health, is the most current, user-friendly system available at this time, and is in fact the only system with its range of capabilities. *(A full description of this system is attached)*. The rental cost for Valley View Hospital for this advanced telecommunications system is \$163,800 for a 36-month period; other associated costs for Control Stations and wireless system enhancements are \$65,400. *(A spreadsheet with delineated budget is included)*. Our initial urban partner, Presbyterian/St. Lukes will purchase their own system and pay all associated costs of implementation, training, and maintenance at their facility.

### ***Background***

Telemedicine is vital to bringing medical expertise to our rural areas, yet the FCC's Rural Health Care Pilot Program has been sorely underutilized over the last ten years. Health care providers have been slow to develop and access broadband facilities; there has been minimal adoption of traditional telemedicine solutions as well. This failure to engage is surely due in part to the shortcomings of traditional telemedicine. Prohibitively high costs of technical support, the inaccessibility of control stations, the centralized-hub system required by traditional telemedicine and the simple matter of the equipment being in the wrong location when it's

needed all limit the usefulness of existing systems. It's no wonder healthcare providers are reluctant to buy in.

Valley View Hospital believes that telemedicine is the solution to bringing modern medical care into our rural areas as long as providers are given the *right* technology—the best fit solution to their needs. One of the primary stumbling blocks in rural care is the lack of access to specialty physicians. Local primary care doctors can refer patients to specialists who for the most part reside in cities, but that may require the patient to drive several hours. Weather and road conditions are often terrible impediments to safe travel, and lost time from work often keeps patients home. Very sick patients must have a relative or someone drive them to the doctor adding another level of complexity in seeking specialty care. With all of these barriers to treatment, patients tend to postpone making appointments with distant specialists, and their conditions may worsen.<sup>1</sup>

We believe real-time telehealth, as provided by the RP-7 robotics system is an essential piece to improved patient care, and in turn the wide acceptance and utilization of broadband networks and advanced telemedicine in rural health care practice. The advantages of this system are great:

- Technical support is provided off-site by the supplier of the RP-7 system; there is no need for large infrastructure costs for the facilities,
- Control stations can be located anywhere—where patients are treated and where physicians work, *not* in an out-of-the-way location,
- The system provides improved specialist care through remote consultations with potentially significant impact on patient outcomes,
- There is an increased ability of community hospitals to retain appropriate patients,
- There are enhanced training opportunities for physicians and staff at rural hospitals resulting in increased physician/staff satisfaction,
- Resources can be shared throughout a network of RP-7 users,
- The System can be used for surgical mentoring; enabling practicing surgeons who are competent in basic techniques to learn advanced new techniques under the guidance of an expert surgeon located at another site.
- Nurse education: extension of training and mentoring to nursing staff,
- Rural residency and rural staff teaching: expand the learning opportunities for hospital residents and staff,
- Perhaps most importantly, the system leads to increased patient satisfaction—patients and families are comforted knowing the patient is receiving expert care within his/her community.

The growing record of the advantages and acceptance of real-time telehealth is highlighted in this excerpt from the Cut Bank Pioneer Press, February 28, 2007:

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<sup>1</sup> Gernment Health IT, March 26, 2007

*Northern Rockies Medical Center (NRMC), in Cut Bank, MT, is the first hospital in north central Montana to offer telehealth medical exams. NRMC recently conducted its first telehealth exam and everyone involved, the patient, nurse, doctor and the facility, deemed it a huge success.*

*"It was an amazing exam," said Pam Condon, R.N., was the nurse performing the exam in Cut Bank for the physician who, at the time, was in 106 miles away in Great Falls. "The doctor can hear everything I hear through the use of the special stethoscope, which is hooked up to the telehealth equipment. He was even able to see and talk to the patient." Likewise, the patient can see the physician on the monitor and even though it isn't face-to-face, it sure feels and looks that way, for everyone involved.*

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*One of the most popular uses of telehealth right now is the physician-patient consults. For those in rural communities, this could be a huge time saver. "The consult we did three weeks ago took 20 minutes," said Taylor. "Without telehealth, the patient would have had to drive to Great Falls, spending about three hours round-trip travel time for a 20 minute visit with the specialist."*

*"This type of healthcare can save patients travel time and money," said Boland. "It could also be termed a way to keep patients safe. In the past, they might have been forced to travel on bad roads to keep an appointment they had with a physician out of town. Now all they have to do is drive across town."*

### ***Goals and Objectives:***

Valley View Hospital, linking to the specialty network of Presbyterian/St. Lukes Regional Medical Center in Denver, will install a similar real-time telehealth system to the one described in the preceding excerpt. We will demonstrate the efficacy of advanced telemedicine using the RP-7 system and collect data which shows the value for other rural health care providers. Our successful implementation will encourage others to participate in the design and building of vital broadband networks so that they too can incorporate the advanced telehealth applications available through the RP-7 system into their hospitals and clinics, bringing the advantages of modern healthcare technology to our rural areas.

With funding from the Federal Communication Commission under Docket No. 02-60, Valley View Hospital will purchase, install, and provide training to physicians and nursing staff for the RP-7 robotic system. Implementation of this real-time telehealth program will meet the following objectives:

1. Provide real-time specialty consultations for Valley View Hospital patients, patients from our outlying medical clinics, and for patients referred by our Western HealthCare Alliance partners including Aspen Valley Hospital, The Memorial Hospital, and St. Mary's Hospital & Regional Medical Center.
2. Demonstrate the desirability of broadband connectivity and acceptance and utilization of advanced telehealth applications to other rural health care providers.
3. Act as the pilot program that initiates the launch of a network of real-time telehealth connectivity throughout the hospitals of the Western Health Care Alliance.
4. We will communicate our achievements through Western HealthCare Alliance (WHA) news forums, newspaper advertising, and letters to WHA members that highlight our success.
5. We will encourage members to get onboard and participate in the next funding cycle of the FCC's Rural Health Care Pilot Program.
  - The next step, under a second-phase, will be to lead a broader deployment in key disciplines as defined by the needs of our rural populations. Specifically, neurology, neonatology, cardiology, oncology and dermatology are all specialties that work well with the RP-7 system and are underprovided in rural areas.
  - We will work within the existing Western HealthCare Alliance to define a robotics-based telehealth network connecting critical access hospitals to regional medical centers such as Valley View and key facilities along the Front Range of Colorado.

***Estimated Total Costs***

<b>Valley View Hospital</b>	<b>FCC Cost (0.85)</b>	<b>Valley View Cost (0.15)</b>	<b>Total Cost</b>
Rental and installation of RP-7 robotic system (36 month agreement)	\$139,230	\$24,570	\$163,800
Control station purchase and installation, wireless access points	\$55,590	\$9,810	\$65,400
<i>Total Cost</i>	\$195, 670	\$34, 350	\$230,200
<b>Presbyterian/St. Lukes Hospital</b>		<b>P/SL Cost (1.00)</b>	<b>Total Cost</b>
Rental and installation of RP-7 robotic system (36		\$163,800	\$163,800

month agreement)			
Control station purchase and installation, wireless access points		\$32,100	\$32,100
<i>Total Cost</i>		\$195,900	\$195,900

*(For delineated costs, please see the attached spreadsheet.)*

### ***For-Profit Participants***

With over 80 specialties and 1,000 specialists and primary care physicians, Presbyterian/St. Luke's Medical Center (P/SL) is the leading regional hospital, serving Denver and the Rocky Mountain and Great Plains regions. Licensed for 680 beds and staffed by nearly 1,600 employees, P/SL serves a seven-state region, including Colorado, Kansas, Nebraska, New Mexico, South Dakota, Utah, and Wyoming. P/SL is a leader in caring for high-acuity fetal, neonatal, pediatric and adult patients.

P/SL is the most advanced hospital in the region that offers one campus with comprehensive care for adult and pediatric patients, featuring innovative Advanced Centers for:

- Cancer
- Blood & Marrow Transplant through the Rocky Mountain Blood and Marrow Transplant Program
- Adult & Pediatric Minimally Invasive Surgery
- 24/7 On-campus Adult & Pediatric Intensivists
- Advanced Imaging Technologies
- High-risk Maternal-Fetal Care 24/7
- Colorado's Largest Neonatal Intensive Care Unit
- Orthopedics & Pediatric Ortho
- Replant Specialists
- Kidney Transplant
- Infectious Diseases
- Wound Healing

P/SL understands the enormous benefits of real-time telehealth applications for rural areas where access to specialists and modern medical services is severely limited. Because of the huge potential in cost savings and improved quality of patient care, P/SL is excited to participate as a for-profit institution in Valley View Hospital's proposed pilot program. P/SL will pay all costs associated with the acquisition, installation, and usage of the RP-7 robotic system at their facility.

### ***Sources of Financial Support/Anticipated Revenues***

Real-time telemedicine will benefit Valley View Hospital in many ways, most of them patient-focused. The RP-7 Robotic System will allow us to keep patients in the community, treat them in collaboration with remote specialists, and be regarded



as a high quality source of care. In turn, we expect that we will be able to retain a greater percentage of patients and attract new ones. Therefore, anticipated revenues are of the “downstream” variety: they come from retention-- rather than transfer--of patients, and an increase in the number of patient visits from patients drawn to the hospital for remote consultations.

Overall, patient safety and well being, as well as service to the community, are our primary goals in the implementation of the RP-7 system.

#### Reimbursement:

Valley View Hospital is in Garfield County, a designated rural area under Medicare. This means that Medicare will reimburse for physician consultations in Garfield County when approved CPT codes are applied.

As of January 22, 2007 the Department of Health and Human Services put out new guidelines for telemedicine which allow us to use a modifier in medical codes used as a basis for identifying, tracking and reimbursing for telemedicine. The modifiers "TM" and "TV" are commonly used to make this distinction.

#### *Eligible Medical Services -*

Services that are eligible for reimbursement include consultation, office visits, individual psychotherapy and pharmacologic management delivered via a telecommunications system. The official CMS policy reads as follows:

“The use of a telecommunications system may substitute for a face-to-face, "hands on" encounter for consultation, office visits, individual psychotherapy and pharmacologic management. These services and corresponding current procedure terminology (CPT) codes are listed below.

- Consultations (CPT codes 99241 - 99275)
- Office or other outpatient visits (CPT codes 99201 - 99215).
- Individual psychotherapy (CPT codes 90804 - 90809)
- Pharmacologic management (CPT code 90862)
- Psychiatric diagnostic interview examination (CPT code 90801)
- End stage renal disease related services (HCPCS codes G0308, G0309, G0311, G0312, G0314, G0315, G0317, and G0318)
- Individual Medical Nutrition Therapy (HCPCS codes G0270, 97802, and 97803)”

#### ***Health Care Facilities to Be Included***

Valley View Hospital

1906 Blake Ave.

Glenwood Springs, CO 81601

(970) 384-7076

RUCA #: 7

Contact: Ronald W. Hines, Director, Information Technology

*Valley View Hospital's affiliated outpatient clinics:*

Eagle Valley Medical Center, Roaring Fork Hospice, Mountain Family Health Center, The Heart & Vascular Center, Outlaw Medical Arts (*Rifle*), Silt Imaging & Medical Center, Willits Medical Center (*Basalt*), A Woman's Place, and Pediatric Partners

Presbyterian/St. Lukes Medical Center  
1719 E. 19th Avenue  
Denver, CO 80218  
(303) 839-6000  
RUCA #: 1  
Stephen Rothenberg, MD, Chair of Pediatrics

*Referral Centers:*

Aspen Valley Hospital  
0401 Castle Creek Road  
Aspen, Colorado 81611 ·  
(970) 925-1120  
RUCA #: 7

The Memorial Hospital  
785 Russell Street  
Craig, CO 81625  
(970) 924-9411  
RUCA #: 7

St. Mary's Hospital & Regional Medical Center  
2635 N. 7<sup>th</sup> Street  
Grand Junction, CO 81502  
(970) 244-2273  
RUCA #: 1

As mentioned, we will approach other members of the Western HealthCare Alliance, as well as key urban providers, for inclusion in a second phase of real-time telehealth partnerships under the FCC's 2007 Funding Year.

***Project Management Plan***

We have chosen our best personnel to lead this project through implementation and ongoing success. At Valley View Hospital, Ronald Hines, Director of Information Technology, will be the project manager. His expertise and experience guiding

Valley View in its adoption of the PACS, Atlas Labs interface and VPN programs will be a perfect fit for management of the RP-7 project.

At P/SL, we will work with Dr. Stephen Rothenberg. A pediatric surgeon, Dr. Rothenberg is a pioneer in minimally invasive procedures for newborns and other areas of his field. He is interested in the application of more patient and physician-friendly applications of telemedicine and will champion the project at this regional medical center.

P/SL and Valley View Hospitals' Dr. Ian Dresner have defined one of the first real-time telehealth programs for VVH's RP-7 system. As a pediatric nephrologist, Dr. Dresner's expertise is in very high demand. He will not only provide real-time consultations to P/SL patients and doctor to doctor consultations, he will also use the RP-7 system to act as a Faculty Advisor to a newly-recruited onsite pediatric nephrologist. We expect that use of the robots will extend rapidly into consultations from neurology, oncology, dermatology, and many other areas of medical specialty.

#### RP-7 Installation

InTouch Health (ITH) will provide all the necessary support to successfully install the RP-7 System at Valley View and Presbyterian/St. Lukes Hospitals. With over 100 Robot sites installed, ITH has refined the installation process so that it requires very little time from hospital IT staff.

Installation of a Robot includes:

- an IT needs assessment,
- installation of the Robot on the Hospital network,
- training of physicians and clinical staff, and
- applications coaching.

#### Pre-installation IT Needs Assessment

ITH will schedule an initial site survey or conference call to assess our current IT status. Key factors covered in the IT assessment include the network topography, wireless configuration, firewall traversal strategy, and the testing of broadband speed and latency.

#### Robot Install

ITH staff will unpack, check, install and test the RP-7 Robots on each Hospital's network. One day is allocated for each Robot install.

- Onsite installation onto customer network and testing
- Wireless network testing & certification of coverage area
- Fleet monitoring configuration and testing

#### Physician and Clinical Staff Training

At each Robot site, the ITH will in-service and train hospital clinical staff throughout a 2-3 day period.

- In-servicing will occur during multiple hospital staff shifts over the 2-3 day period.
- Robot system functionality and staff responsibilities will be shared.
- HIPAA privacy and other questions will be addressed.
- Driver training and certification of physician users for a minimum of 1 hour per physician (subject to availability).

### ***Coordination throughout the State/Region***

As a member of the Western HealthCare Alliance, Valley View Hospital has an existing communication channel in place for relaying the success of this project. The Western HealthCare Alliance was established in 1989 as the first formal commitment of rural hospitals in Colorado to combine resources in order to improve regional health care. The Alliance provides members with a forum for identifying, discussing and collectively addressing rural health care issues. The Alliance has a newsletter, periodic meetings and teleconference calls that all can be used as avenue for strengthening the network of providers who use our real-time telehealth system.

Through this organization, we will encourage other members to explore, design and implement broadband networks in their areas, and to implement advanced telecommunication applications to improve health care across rural Colorado. After we have a working functional model, we will work with Alliance members to recruit physician groups/specialists that meet the regions' needs. We will then identify the placement for additional spokes to the system and encourage those facilities to apply for funding for the deployment of robots at their locations. In this way, we will develop a network of users sharing resources and expertise, bringing with it the advantages of telemedicine into Colorado's rural areas.

### ***Western HealthCare Alliance Members:***

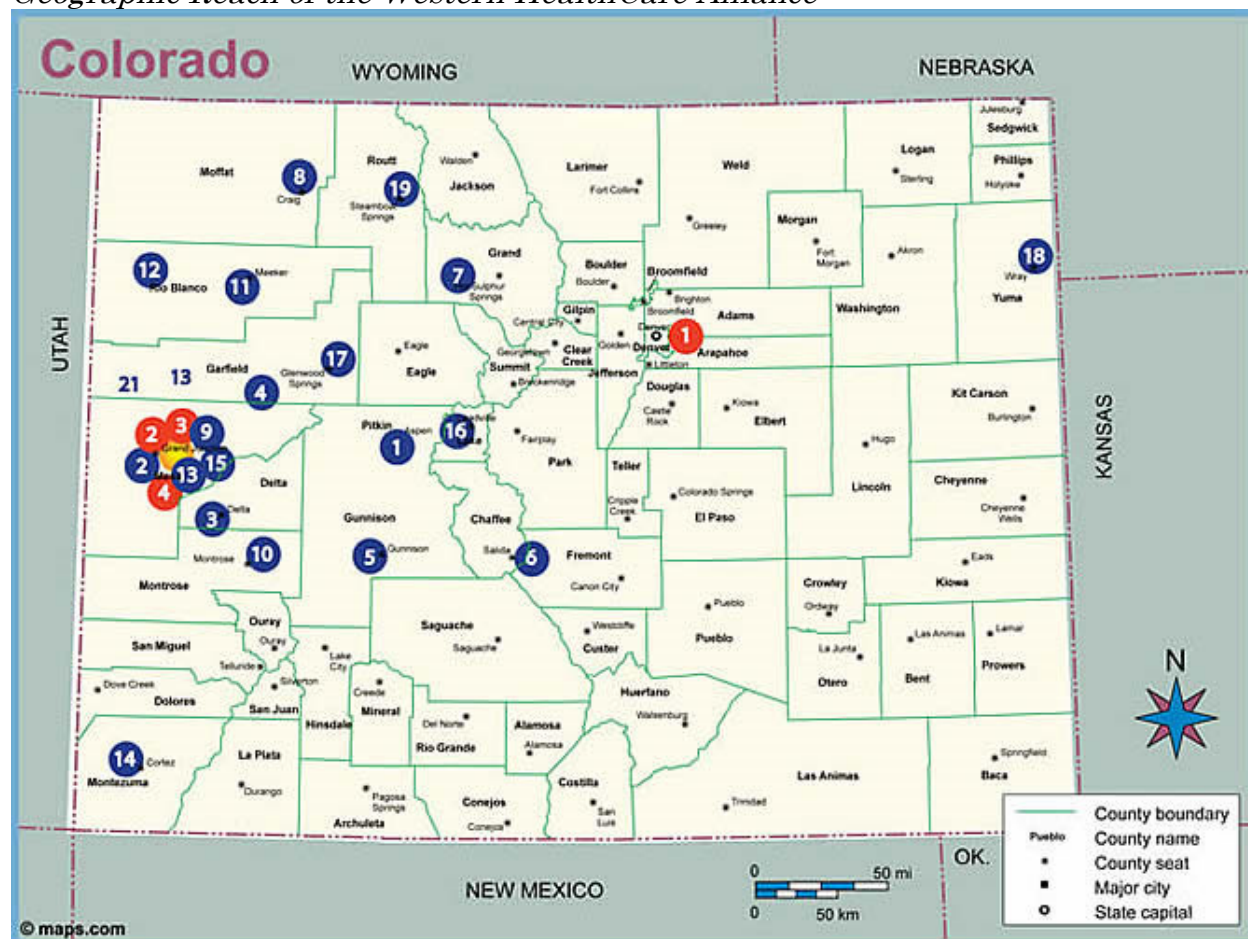
- 1) Aspen Valley Hospital, Aspen (RUCA: 7)
- 2) Community Hospital, Grand Junction (RUCA: 1)
- 3) Delta County Memorial Hospital, Delta (RUCA: 8)
- 4) Grand River Medical Center, Rifle (RUCA: 7)
- 5) Gunnison Valley Hospital, Gunnison (RUCA: 7)
- 6) Heart of the Rockies Regional Medical Center, Salida (RUCA: 7)
- 7) Kremmling Memorial Hospital, Kremmling (RUCA: 10)
- 8) The Memorial Hospital District, Craig (RUCA: 7)
- 9) Mesa County Physicians IPA, Grand Junction (RUCA: 1)
- 10) Montrose Memorial Hospital, Montrose (RUCA: 4)
- 11) Pioneers Hospital of Rio Blanco County, Meeker (RUCA: 10)
- 12) Rangely District Hospital, Rangely (RUCA: 10)

- 13) Rocky Mountain Health Plans, Grand Junction (N/A)
- 14) Southwest Memorial Hospital, Cortez (RUCA: 7)
- 15) St. Mary's Hospital & Regional Medical Center, Grand Junction (RUCA: 1)
- 16) St. Vincent General Hospital, Leadville (RUCA: 7)
- 17) Valley View Hospital, Glenwood Springs (RUCA: 7)
- 18) Wray Community District Hospital, Wray (RUCA: 10)
- 19) Yampa Valley Medical Center, Steamboat Springs (RUCA: 7)

### *Associate Members*

- 1) The Children's Hospital, Denver (RUCA: 1)
- 2) Hospice & Palliative Care of Western Colorado, Grand Junction
- 3) Quality Health Network, Grand Junction
- 4) Western Colorado Area Health Education Ctr., Grand Junction

### *Geographic Reach of the Western HealthCare Alliance*



## **RP-7 Robot Description**

InTouch Health has developed the RP-7 robotic system (Figure 1), which is a tele-operated, mobile robotic system that enables “remote presence”. Remote presence allows individuals to project themselves from one geographic location to another, via the wireless mobile robot, such that they can interact in that remote location as if they were physically present.

The RP-7 system incorporates 2-way audio/video that permits observation and face-to-face interaction between healthcare workers and patients. The robot is controlled remotely by the healthcare professional using a computer workstation (Control Station) or laptop that can be wirelessly connected to the Internet via broadband transmission. From the Control Station or laptop, the healthcare professional can drive the robot around in the facility and communicate real-time both visually and verbally with patients and other medical staff. The RP-7 is 5.5 ft. tall and weighs about 200 lbs. The anthropomorphic design consists of a “head” which contains a flat screen monitor, digital camera and microphone. The central body houses the speaker and robot-side volume control and can include, on the backside, a handset for private conversation, a printer and medical devices such as a stethoscope. It all rides on a holonomic platform about 20 in. wide made up of three balls that allow it to move in any direction including maneuverability in tight spaces. An array of proximity sensors placed around the lower section of the robot prevents the robot from colliding with people or objects.



**Control Station**



The RP-7 system is currently used in over fifty hospitals and long-term care (LTC) facilities across United States. This progressive technology enables healthcare professionals to instantly project themselves to where they are needed so that they can consult more frequently and immediately with patients, LTC residents, and other healthcare professionals. The robots are used for:

- patient rounding,
- ICU consulting/assessment,
- Emergency Department consults,
- stroke assessment,
- accessing specialists remotely,
- integration of pediatric services,
- tele-mentoring and
- Nurses' training.

#### Advantages and Gains for Rural Areas:

The RP-7 robotic system greatly reduces barriers of time and distance; it increases the efficiency with which healthcare professionals can operate across multiple locations—this results in higher quality care at a reduced cost. One neuroscience ICU study completed in 2006 at the David Geffen School of Medicine at UCLA concluded that use of the remote presence robotic system resulted in these benefits: 1) rapid assessment of unstable patients by physician, 2) reduced length of stay for certain neurosurgical patients, 3) reduction in hospital cost, 4) improved efficiency and net bed capacity for the ICU.